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PROCESSING CABBAGE CULTIVAR EVALUATION TRIALS

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PROCESSING CABBAGE CULTIVAR EVALUATION TRIAL FOR NORTHWESTERN OHIO

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The cabbage cultivar trial was conducted at the Vegetable Crops Branch of the Ohio Agricultural Research and Development Center, near Fremont, Ohio. The soil is a sandy loam. The plots received 750 lbs. per acre of 15-15-15 plus 1 lb. per acre of boron pre-plant broadcast.

The study was field seeded on May 4 in rows spaced 30 ft. long on 30-in. centers. The rows were hand-thinned after emergence to 18 in. between plants. Each cultivar was replicated 4 times in a complete randomized block design.

Commercial practices for weed, insect and disease control were followed and no serious problems developed during the season. May and June had above normal amounts of rainfall and some severe water injury occurred from which the plants did not fully recover. Then during head formation, phytotoxicity occurred from herbicide contamination in the sprayer normally used for insecticide application. These two problems greatly affected yield and, therefore, the yield data are unreliable! The degree that this also affected thrip activity is not known. Efforts were made to collect data from areas that received less injury, but certainly all plots did have injury to some degree.

When the majority of the heads in a plot reached maturity as indicated by size and firmness, the cultivars were evaluated for plant size, plant uprightness (for mechanical harvesting), uniformity and apparent head shape. After harvest weight and numbers of heads were recorded, 3 heads from each plot were cut and core length and equatorial and polar diameters recorded, internal color, leaf mid-rib thickness and tip burn were evaluated. Five heads were examined for susceptibility to thrips and evaluated for thrip injury. Each head was given a damage rating from 0-no damage to 4-severe bronzing extending several layers deep into the head. Next, the heads were trimmed to remove all thrips damage. The cabbage that had to be trimmed was weighed (cull weight) and the time required to do the trimming was recorded (trim time). Finally, the amount of cull was calculated as a percentage of the total weight of the head, giving a measure of the percentage of the head damaged by thrips.

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Results showed that all varieties had at least some thrips damage in this year's trial (Fig. 1). Named varieties that were quite susceptible to thrips damage in the trial were Carolton, Hinova, Krautman, Quisto, and Rodolpho. Varieties with less thrips damage were Histona, Grand Slam, Superkraut, and Titanic-90. We consider the use of a less susceptible variety to be the best method of avoiding thrips damage in cabbage crops.

Monthly rainfall totals were:

		Irrigated	
May 4 to 31	5.66 in.	July 11	2.00 in.
June	4.43 in.		
July	1.38 in.		
August	2.30 in.		
to September 27	1.81 in.		

Seed companies who provided seed for the trials include Bejo Zaden (BZ), Ferry Morse Seed Co. (FM), Harris-Moran Seed Co. (HM), Northrup King Co. (NK), Reed's Seeds (R), Royal Sluis (RS), Seedway, Inc. (SW), and Sakata Seeds (SA).

TABLE 1. Yield and quality characteristics of cabbage cultivars for processing. Replicated Trial-1989.

Cultivars	Source	Harvest Data			Measurements (in.)		
		Date harv.	Tons/ acre	Lbs/ head	Core length	Polar diam.	Equat. diam.
Grand Slam	SA	9/12	19.4	6.3	3.00	7.05	8.44
Applause	HM	9/12	18.6	6.3	2.50	7.39	7.83
Carolton	BZ	9/27	18.3	7.1	2.78	7.89	7.89
Vantage	SA	9/12	18.0	6.7	2.67	7.72	7.72
Hinova	BZ	9/27	18.0	5.3	2.39	7.50	7.00
Vantage Point	SA	9/27	17.7	6.1	2.78	7.22	7.67
Krautpacker	SW	9/27	17.5	5.8	2.94	7.89	7.89
Rodolpho	BZ	9/12	16.7	5.3	3.22	7.94	7.83
Superkraut	R	9/27	16.4	5.1	3.00	6.78	7.00
HMX-5252	HM	9/27	16.3	6.4	2.89	7.05	8.17
Quisto	NK	9/12	16.2	5.9	3.22	6.94	7.28
Krautman	SW	9/12	15.8	5.0	2.72	7.44	7.17
Titanic-90	FM	9/27	15.8	4.8	3.00	6.83	7.78
King Cole	FM	8/30	14.1	4.2	3.28	7.11	7.22
Histona	SW	8/30	13.3	4.1	2.50	7.28	7.05
Olympic	NK	9/12	12.7	7.2	3.33	6.94	7.89
Marvellon	R	8/30	10.5	3.2	2.72	7.05	6.66
Atria	R	9/27	10.4	3.5	2.94	6.67	6.22
LSD .05				2.36			1.15

TABLE 2. Quality characteristic ratings of cabbage cultivars for processing. Replicated Trial-1989.

Cultivar	Plant Characteristics*		
	Uniformity	Plant Size	Plant Uprightness
Grand Slam	1	3	2
Applause	1	2	2
Carolton	2	2	3
Vantage	1	2	1
Hinova	1	3	2
Vantage Point	1	2	2
Krautpacker	2	2	3
Roldolpho	2	3	3
Superkraut	1	2	3
HMX-5252	2	2	2
Quisto	1	2	1
Krautman	2	2	2
Titanic 90	1	3	2
King Cole	3	2	1
Histona	1	1	2
Olympic	1	2	1
Marvellon	2	2	2
Atria	1	2	1

* Uniformity: 1 = good; 2 = fair; 3 = poor
Plant Size: 1 = small; 2 = medium; 3 = large
Uprightness: 1 = upright; 2 = slightly tipped; 3 = very tipped

TABLE 3. Yield and quality characteristics of cabbage cultivars for processing. Observational Trial-1989.

Cultivars	Source	Harvest Date			Measurements (in.)		
		Date harv.	Tons/ acre	Lbs/ head	Core length	Polar diam.	Equat. diam.
Oscar	RS	8/30	19.0	5.47	2.66	7.00	7.83
Superdane	R	9/27	16.7	4.80	3.33	7.00	7.00
Falcon	RS	9/12	16.3	6.25	3.16	7.83	7.83
Marathon	NK	9/27	15.7	6.75	2.83	7.50	7.66
HMX-7273	HM	9/12	12.5	6.17	3.17	7.00	7.83
Rinda	RS	9/12	12.2	5.27	2.66	6.83	6.50
HMX-7271	HM	9/12	7.0	7.10	3.33	6.83	8.17
FMX-192	FM	8/30	6.6	5.67	3.00	7.16	7.50
HMX-7272	HM	9/12	6.4	6.50	2.66	7.66	7.50

TABLE 4. Quality characteristics of cabbage cultivars for processing. Observational Trial-1989.

Cultivar	Plant Characteristics*		
	Uniformity	Plant Size	Plant Uprightness
Oscar	2	2	3
Superdane	1	2	2
Falcon	1	3	3
Marathon	2	1	2
HMX-7273	2	2	3
Rinda	1	2	3
HMX-7271	1	3	3
FMX-192	1	2	2
HMX-7272	1	2	3

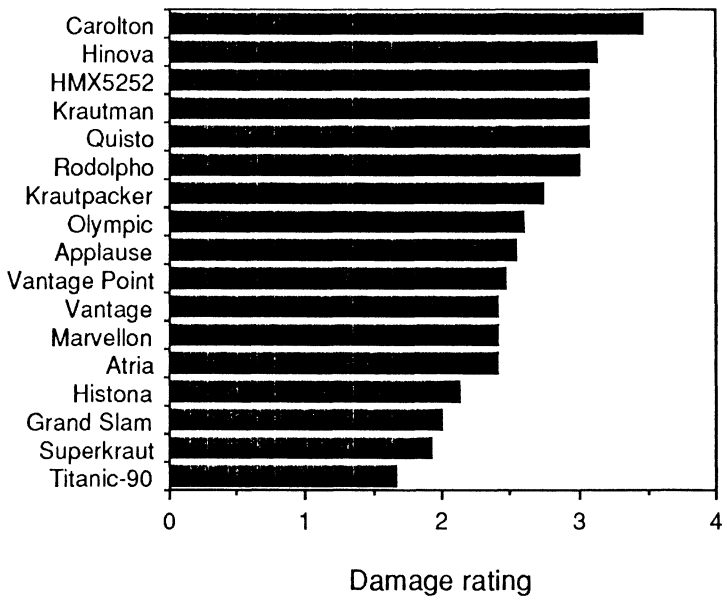
*Uniformity: 1 = good; 2 = fair; 3 = poor
Plant Size: 1 = small; 2 = medium; 3 = large
Uprightness: 1 = upright; 2 = slightly tipped; 3 = very tipped

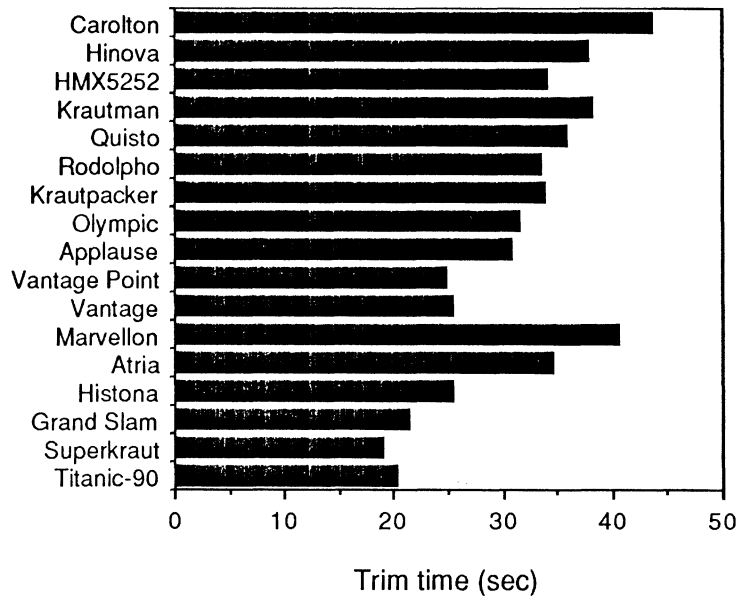
TABLE 5. Additional observations on cultivars and lines including internal quality - 1989.

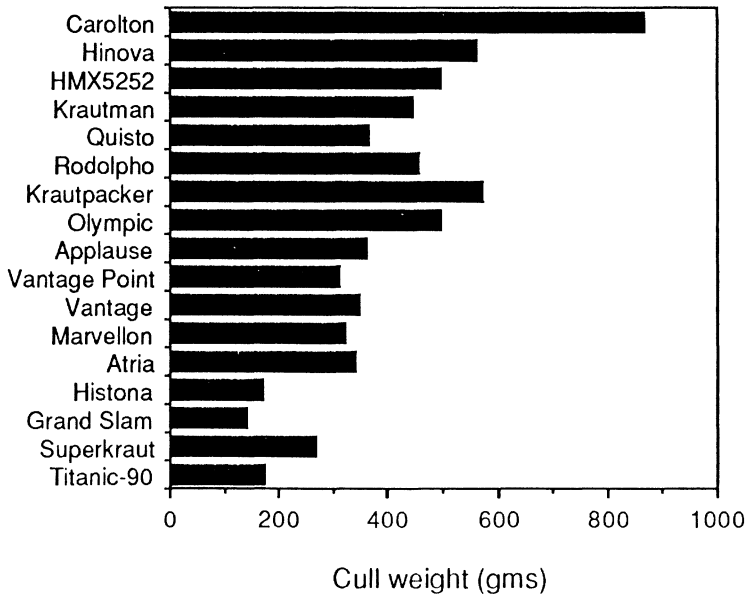
Cultivar	Comments
Grand Slam	Large frame, good uniformity, slightly tipped, medium mid-ribs, light yellow inside, mild flavor, less susceptible to thrips damage.
Applause	Medium frame, good uniformity, slightly tipped, medium mid-ribs, yellow inside, good flavor, moderately susceptible to thrips damage.
Carolton	Medium frame, fair uniformity, very tipped, thick mid-ribs, light yellow inside, strong flavor, highly susceptible to thrip damage.
Vantage	Medium frame, good uniformity, upright, thick mid-ribs, light yellow inside, strong flavor, moderately susceptible to thrip damage.
Hinova	Large frame, good uniformity, slightly tipped, thick mid-ribs, yellow green inside, mild flavor, very susceptible to thrip damage.
Vantage Point	Medium frame, good uniformity, slightly tipped, thick mid-ribs, light yellow inside, sweet flavor, strong after taste, moderately susceptible to thrip damage.
Krautpacker	Medium frame, fair uniformity, very tipped, thick mid-ribs, few small inside basal buds, yellow green inside, very strong flavor, very susceptible to thrip damage.
Rodolpho	Large frame, fair uniformity, very tipped, thick mid-ribs, light yellow inside, very strong flavor, very susceptible to thrip damage.
Superkraut	Medium frame, good uniformity, very tipped, medium to large mid-ribs, yellow green inside, outside basal buds, mild flavor, less susceptible to thrip damage.
HMX-5252	Medium frame, fair uniformity, slightly tipped, thick mid-ribs, yellow green inside, bland flavor, very susceptible to thrip damage.
Quisto	Medium frame, good uniformity, upright, thick mid-ribs, light yellow inside, small basal buds, light tan color around core, strong flavor, very susceptible to thrip damage.

Cultivar	Comments
Krautman	Medium frame, fair uniformity, slightly tipped, thick mid-ribs, tan around outside of core, yellow green inside, mild to sweet flavor, very susceptible to thrip damage.
Titanic-90	Large frame, good uniformity, slightly tipped, thick mid-ribs, yellow green inside, strong flavor, less susceptible to thrip damage.
King Cole	Medium frame, poor uniformity, upright, medium mid-ribs, light yellow inside, small band of tip burn, mild flavor, less susceptible to thrip damage.
Histona	Small frame, good uniformity, slightly tipped, thick mid-ribs, gray around outside of core, yellow green inside, very mild flavor, less susceptible to thrip damage.
Olympic	Medium frame, good uniformity, upright, medium mid-ribs, greenish yellow inside, mild flavor, moderately susceptible to thrip damage.
Marvellon	Medium frame, fair uniformity, slightly tipped, thick mid-ribs, light yellow inside, mild flavor, moderately susceptible to thrip damage.
Atria	Medium frame, good uniformity, upright, thick mid-ribs, light yellow inside, bland flavor, less susceptible to thrip damage.
Oscar	Medium frame, fair uniformity, very tipped, medium mid-ribs, light yellow inside, strong flavor, susceptibility to thrip damage unknown.
Superdane	Medium frame, good uniformity, slightly tipped, very thick mid-ribs, yellow green inside, strong flavor, strong after taste, moderately susceptible to thrip damage.
Falcon	Large frame, good uniformity, very tipped, very thick mid-ribs, light yellow inside, mild flavor, less susceptible to thrip damage.
Marathon	Small frame, fair uniformity, slightly tipped, thick mid-ribs, yellowish green inside, mild flavor, susceptibility to thrip damage unknown.
HMX-7273	Medium frame, fair uniformity, very tipped, medium large mid-ribs, light brown around core, light yellow inside, strong flavor, susceptibility to thrip damage unknown.

Cultivar	Comments
Rinda	Medium frame, good uniformity, very tipped, thick mid-ribs, yellow green inside, mild flavor, susceptibility to thrips damage unknown.
HMX-7271	Large frame, good uniformity, very tipped, large mid-ribs, light brown around core, light yellow inside, mild flavor, susceptibility to thrip damage unknown.
FMX-192	Medium frame, good uniformity, slightly tipped, medium mid-ribs, light yellow inside, few internal basal buds, mild flavor, susceptibility to thrip damage unknown.
HMX-7272	Medium frame, good uniformity, heads laying on side, thick mid-ribs, light brown around core, light yellow inside, mild flavor, susceptibility to thrip damage unknown.







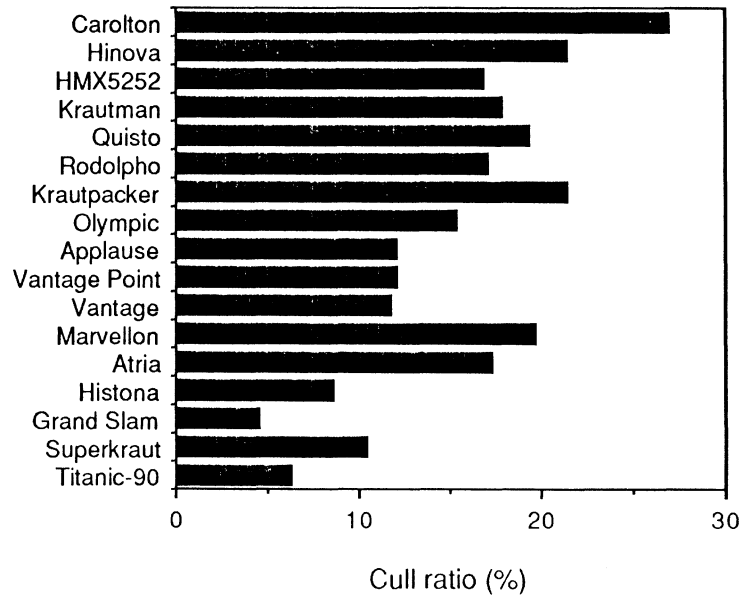


Figure 1. Thrips damage rating and trim of damaged tissues of cabbage cultivars and lines.

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